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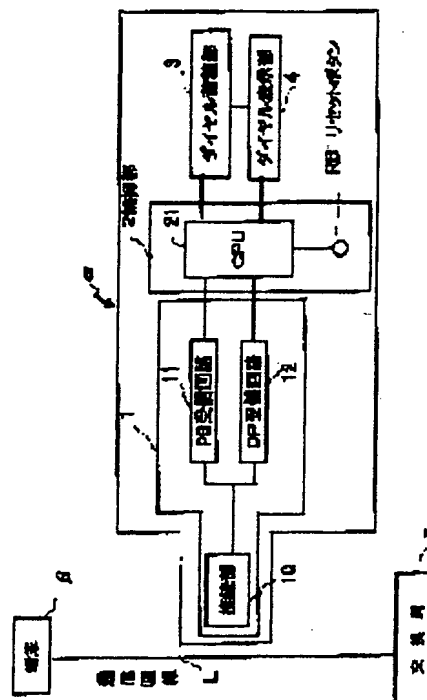
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(54) METHOD AND DEVICE FOR IDENTIFYING AND DISPLAYING DIAL AND RECORDING MEDIUM RECORDING DIAL IDENTIFICATION DISPLAY PROGRAM**(57)Abstract:**

PROBLEM TO BE SOLVED: To provide a method and a device for identifying and displaying dial capable of automatically identifying a dial signal even when the kind of a communication line L is not known and a recording medium recording dial identification display program.

SOLUTION: This device is provided with a line interface part 1 connected with a communication line L for inputting an extracted signal to a PB receiving circuit 11 and a DP receiving circuit 12 and independently and parallel processing the receiving circuits, a control part 2 provided with a CPU 21 for determining a dial on the basis of the result of receiving circuit processing through the line interface part 1 and controlling internal operation, a dial storage part 3 for storing the dial determined by the control part 2 and a dial display part 4 for repeatedly displaying the dial information stored in the dial storage part 3 for each digit according to the control of the control part 2.



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CLAIMS

[Claim(s)]

[Claim 1] A dial discriminating display method characterized by what a signal which transmits a communication line is extracted, the extracted signal concerned is analyzed in parallel processing whenever it extracts, and the dial concerned is displayed for while changing the signal concerned and considering it as a dial, when the extracted signal concerned is a dial signal.

[Claim 2] PB reception which judges whether said parallel processing carries out signal transformation of said extracted signal, and is based on a PB signal, is restricted when the signal concerned is a PB signal, and carries out an output process as said dial, The dial discriminating display method according to claim 1 characterized by a thing which arranges in parallel independently DP reception which judges whether signal transformation is carried out and it is based on DP signal, is restricted when the signal concerned is a DP signal, and carries out an output process as said dial, respectively, and performs it, and which it is processing.

[Claim 3] The dial discriminating display method according to claim 1 or 2 characterized by what is performed when it is presumed that a display of said dial does not newly have extraction of a dial signal by a result of said parallel processing.

[Claim 4] Whenever it extracts a signal which carries out the concurrency of the display of said dial to this, and transmits said communication line, analyze the extracted signal concerned in said parallel processing, and by the parallel processing concerned. The dial discriminating display method according to claim 1, 2, or 3 characterized by what a display is stopped for when it becomes clear that the extracted signal concerned is a dial signal.

[Claim 5] The dial discriminating display method according to claim 1, 2, 3, or 4 characterized by what it is performed for after a display of said dial is accumulated in an accumulation means.

[Claim 6] The dial discriminating display method according to claim 5 characterized by what said display is a display made according to an order from which a dial accumulated in said accumulation means was extracted.

[Claim 7] The dial discriminating display method according to claim 1, 2, 3, 4, 5, or 6 characterized by what said display is a display per figure of said dial.

[Claim 8] The dial discriminating display method according to claim 1, 2, 3, 4, 5, 6, or 7 characterized by what said display is a display performed repeatedly.

[Claim 9] A device which a signal which transmits a communication line top is extracted, the extracted signal concerned is identified, the signal concerned restricts to a dial signal, changes the signal concerned, considers it as a dial, and displays the dial concerned, comprising:

A circuit interface part which dichotomizes, inputs a signal continuously extracted from said communication line in parallel with PB receiving circuit and DP receiving circuit, and performs receiving-circuit processing.

A control section which judge whether the output concerned is based on a dial signal, and a dial is become final and conclusive when an output of said receiving-circuit processing from said PB receiving circuit and DP receiving circuit of the circuit interface part concerned exists, and performs interior-action control.

A dial accumulating part in which said settled dial is stored up in the control section concerned.

A dial indicating part which receives and displays a dial from the dial accumulating part concerned.

[Claim 10] Said PB receiving circuit performs signal transformation of said inputted signal, and it is judged whether it is based on a PB signal, Are a circuit which restricts when proved that it is a PB

signal, changes the inputted signal concerned into dial information, and is outputted to said control section as a result of said receiving-circuit processing, and said control section, An output of said receiving-circuit processing in the case of an output from said PB receiving circuit, The dial discrimination expression device according to claim 9 characterized by what it has for an interior-action control facility which process the output concerned, and said dial is become final and conclusive, without making said judgment, and stores up the dial concerned in said dial accumulating part.

[Claim 11] Said PB receiving circuit is a circuit which changes said inputted signal into signaling information, and is outputted as a result of said receiving-circuit processing so that it can be judged in said control section whether it is a PB signal, An output of said receiving-circuit processing said control section in the case of an output from said PB receiving circuit, When said judgment whether said extracted signal is a PB signal is made on the basis of character of a PB signal based on said signaling information and it is judged as a PB signal by the judgment concerned, The dial discrimination expression device according to claim 9 characterized by what it has for an interior-action control facility which change the signaling information concerned into a dial, and said dial is become final and conclusive, and stores up the dial concerned in said dial accumulating part.

[Claim 12] Said DP receiving circuit performs signal transformation of said inputted signal, and it is judged whether it is based on DP signal, Are a circuit which restricts when proved that it is DP signal, changes the inputted signal concerned into dial information, and is outputted to said control section as a result of said receiving-circuit processing, and said control section, An output of said receiving-circuit processing in the case of an output from said DP receiving circuit, The dial discrimination expression device according to claim 9, 10, or 11 characterized by what it has for an interior-action control facility which process the output concerned, and said dial is become final and conclusive, without making said judgment in said control section, and stores up the dial concerned in said dial accumulating part.

[Claim 13] Said DP receiving circuit is a circuit which changes said inputted signal into signaling information, and is outputted as a result of said receiving-circuit processing so that it can be judged in said control section whether it is DP signal, An output of said receiving-circuit processing said control section in the case of an output from said DP receiving circuit, When said judgment whether said extracted signal is a DP signal is made on the basis of character of DP signal based on said signaling information and it is judged as DP signal by the judgment concerned, The dial discrimination expression device according to claim 9, 10, or 11 characterized by what it has for an interior-action control facility which change the signaling information concerned into a dial, and said dial is become final and conclusive, and stores up the dial concerned in said dial accumulating part.

[Claim 14] The dial discrimination expression device according to claim 9, 10, 11, 12, or 13 characterized by what said dial indicating part is LED of one column display.

[Claim 15] The dial discrimination expression device according to claim 9, 10, 11, 12, 13, or 14 characterized by what said control section possesses for a reset button which initializes the control section concerned, said dial accumulating part, said circuit interface part, and said dial indicating part.

[Claim 16] The dial discrimination expression device according to claim 9, 10, 11, 12, 13, 14, or 15 characterized by what said device is a palm-sized size.

[Claim 17] The dial discrimination expression device according to claim 9, 10, 11, 12, 13, 14, 15, or 16 characterized by what said control section has for an interior-action control facility presumed to be a reception end of a dial signal when decision of a dial new within predetermined time is not made.

[Claim 18] The dial discrimination expression device according to claim 17 characterized by what said control section has for an interior-action control facility which displays a dial on order accumulated in said dial indicating part at said dial accumulating part when [said] presumed.

[Claim 19] In a case where said control section is being actually displayed on said dial indicating part, If decision of a dial is newly made, while stopping said display in said dial indicating part, The dial discrimination expression device according to claim 18 characterized by what the new dial concerned to the dial accumulating part concerned is stored up, and it has for an interior-action control facility which newly supervises existence of decision of a dial within predetermined time again.

[Claim 20] The dial discrimination expression device according to claim 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, or 19 characterized by what it has an interior-action control facility which indicates by repetition for after a display of a series of dials to said dial indicating part ends said control section.

[Claim 21] A circuit interface part which extracts a signal which is connected to a communication line and transmitted in the communication line top concerned, dichotomizes, inputs an extracted signal in parallel with PB receiving circuit and DP receiving circuit, and performs receiving-circuit processing. By controlling the CPU itself built in a dial accumulating part in which the settled dial concerned is stored up, and a dial indicating part which receives and displays a dial from the dial accumulating part concerned at a control section by which ***** connection was made, While judge a result of the receiving-circuit processing concerned, and becoming final and conclusive a dial and accumulating the settled dial concerned in the dial accumulating part concerned, It is the recording medium which recorded a program which controls the display concerned in the dial indicating part concerned, If the program concerned receives an output of said receiving-circuit processing from DP either one of PB receiving circuit of said circuit interface part or a receiving circuit, According to the contents of processing of receiving-circuit processing in a receiving circuit of an outputting agency, perform adding processing required for the output concerned, and said extracted signal judges that it is a dial signal, When the extracted signal concerned is a dial signal, while performing required re-adding processing, becoming final and conclusive said dial and storing up the settled dial concerned in said dial accumulating part, A dial decision accumulation step which supervises a time interval from decision of a dial to the next dial decision, Are a step which shifts when said time interval passes predetermined time by said surveillance in the dial decision accumulation step concerned, and display on said dial indicating part a dial accumulated in said dial accumulating part, and. If an output of receiving-circuit processing is received from DP either one of PB receiving circuit of said circuit interface part or a receiving circuit, According to the contents of processing of receiving-circuit processing in a receiving circuit of an outputting agency, said required adding processing is performed to the output concerned, A dial indicating step which judges whether said extracted signal is a dial signal, Are a step which shifts when it is judged that said extracted signal is a dial signal in said dial indicating step, and stop a display of a dial to said dial indicating part, and. Perform said required re-adding processing to a result to which said required adding processing was performed at an output or the output concerned of said receiving-circuit processing, and a dial is become final and conclusive, . Carry out repeat execution of the dial indicating stop step which stores up the settled dial concerned in said dial accumulating part, and returns to said data decision accumulation step. A recording medium which recorded a dial discrimination expression program characterized by things.

[Claim 22] Said dial decision accumulation step, a dial indicating step, and a dial indicating stop step, When an output from any of PB receiving circuit of said circuit interface part and DP receiving circuit or both sides is dial information, A recording medium which recorded the dial discrimination expression program according to claim 21 characterized by what it supposes that said required adding processing is unnecessary, and a series of processings in which will perform said re-adding processing if necessary to the outputted dial information concerned, and said dial is become final and conclusive are performed for.

[Claim 23] A recording medium which recorded the dial discrimination expression program according to claim 21 or 22 characterized by what said display in said dial indicating step is a display per figure of said dial.

[Claim 24] A recording medium which recorded the dial discrimination expression program according to claim 21, 22, or 23, wherein said display in said dial indicating step is a repetition display.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention is connected to communication lines, such as a telephone line, and the communication line concerned regardless of a push-button phone circuit or a dial line. It is related with the recording medium which recorded the dial discriminating display method, device, and dial discrimination expression program which identify a dial signal automatically and can check dials, such as a telephone number, easily and immediately.

[0002]

[Description of the Prior Art] In order to evaluate the performance of the communication line of the fixed range (for example, arbitrary parts indoor and inside of a floor and a building) of communication lines, such as a telephone line, conventionally, For example, the kind (are they a dial line or a push-button phone circuit?) of the communication line concerned was inputted, and the quality assessment (or the change of circuit deed) device was used.

[0003]

[Problem(s) to be Solved by the Invention] In the conventional quality assessment device, the changeover switch of a push-button phone circuit and a dial line and the changeover switch of the dial pulse (10pps/20pps) were needed, and it needed to set up according to the circuit grade. The information which a quality assessment device is various functions, therefore inputs it, and is set up also had the problem that it could not be used on a large scale [many operativity is also very bad and / a device] and simply.

[0004] After the circuit of an examination evaluation object gets to know what kind of circuit it is beforehand, it is necessary to examine, and especially in many-fold part in which two or more circuits of the kind were laid. In which wiring, which wiring by a push-button phone circuit by the dial line of 10pps. In the evaluation test in the case of having to specify whether it is a dial line of 20pps, and also existing many-fold circuits in 1 floor and 1 building etc. or [that the circuit itself is unusual if the kind of wiring of the circuit to examine is mistaken not to mention it uses a nerve] - - or it changes between operations of a quality assessment device, and it must ***** and only takes time and effort dramatically.

[0005] In here, the main purposes that this invention should be solved are as follows.

[0006] Even if the 1st purpose of this invention is strangeness per kind of communication line, there is in providing the recording medium which recorded the feasible dial discriminating display method, the device, and the dial discrimination expression program.

[0007] the 2nd purpose of this invention -- a communication line -- a push-button phone circuit or a dial line -- a change -- it is in providing the recording medium which recorded the unnecessary dial discriminating display method, the device, and the dial discrimination expression program.

[0008] The 3rd purpose of this invention is to provide the recording medium which recorded the dial discriminating display method, device, and dial discrimination expression program which do not have a use part limited.

[0009] The 4th purpose of this invention is to provide the recording medium which recorded the dial discriminating display method in which miniaturization carrying is possible, the device, and the dial discrimination expression program.

[0010] The 5th purpose of this invention is to provide the recording medium which recorded the economical dial discriminating display method, the device, and the dial discrimination expression program by power saving.

[0011] Other purposes of this invention will become naturally clear from the statement of each claim in a specification, a drawing, especially a claim.

[0012]

[Means for Solving the Problem] this invention method has the feature which performs parallel processing of PB reception and DP reception for the extracted signal concerned independently, when a signal from a communication line is extracted in solution of an aforementioned problem.

[0013] A circuit interface part which this invention device makes a dial signal extracted from a communication line input [circuit interface part] into PB receiving circuit and DP receiving circuit in solution of an aforementioned problem, and carries out receiving-circuit processing in parallel. It has the feature possessing a control-section which performs interior-action control, a dial accumulating part which accumulates a dial fixed in the control section concerned, and a dial indicating part which displays a dial accumulated in the dial accumulating part concerned.

[0014] A circuit interface part which it is made to connect with a communication line, and this invention recording medium extracts a signal on the communication line concerned in solution of an aforementioned problem, is inputted into PB receiving circuit and DP receiving circuit, and performs receiving-circuit processing in parallel. It is a program which controls the CPU itself built in a control section connected to a dial accumulating part which accumulates a settled dial, and a dial indicating part which receives and displays a dial from the dial accumulating part concerned, respectively. The program concerned records a program which has the feature which comprises a dial decision accumulation step, a dial indicating step, and a dial indicating stop step.

[0015] If it states to a concrete detail, when this invention adopts a new characteristic configuration method or a means ranging from a generic concept to a subordinate concept enumerated next, by solution of the technical problem concerned, it will be made as [attain / the above-mentioned purpose].

[0016] The 1st feature of this invention method extracts a signal for which a communication line is transmitted, and analyzes the signal concerned extracted whenever it extracted in parallel processing, and when the extracted signal concerned is a dial signal, While changing the signal concerned and considering it as a dial, it is in composition adoption of a dial discriminating display method which displays the dial concerned.

[0017] Said parallel processing in the 1st feature of an above-mentioned this invention method the 2nd feature of this invention method, PB reception which judges whether signal transformation of said extracted signal is carried out, and it is based on a PB signal, is restricted when the signal concerned is a PB signal, and carries out an output process as said dial. It is in composition adoption of a dial discriminating display method which is the processing which arranges in parallel independently DP reception which judges whether signal transformation is carried out and it is based on DP signal, is restricted when the signal concerned is a DP signal, and carries out an output process as said dial, respectively, and performs it.

[0018] The 3rd feature of this invention method has the display of said dial in the 1st or 2nd feature of an above-mentioned this invention method in composition adoption of a dial discriminating display method which it comes to carry out when it is presumed that there is newly no extraction of a dial signal by a result of said parallel processing.

[0019] In the 1st, 2nd, or 3rd feature of an above-mentioned this invention method the 4th feature of this invention method, Whenever a display of said dial extracts a signal which carries out a concurrency to this and transmits said communication line, it analyzes the extracted signal concerned in said parallel processing, and it by the parallel processing concerned. When it becomes clear that the extracted signal concerned is a dial signal, it is in composition adoption of a dial discriminating display method which stops a display.

[0020] The 5th feature of this invention method has the display of said dial in the 1st, 2nd, 3rd, or 4th feature of an above-mentioned this invention method in composition adoption of a dial discriminating display method which it comes to carry out after being accumulated in an accumulation means.

[0021] The 6th feature of this invention method has said display in the 5th feature of an above-mentioned this invention method in composition adoption of a dial discriminating display method which is the display made according to an order from which a dial accumulated in said accumulation means was extracted.

[0022] The 7th feature of this invention method has said display in the 1st, 2nd, 3rd, 4th, 5th, or 6th feature of an above-mentioned this invention method in composition adoption of a dial

discriminating display method which is the display per figure of said dial.

[0023]The 8th feature of this invention method has said display in the 1st, 2nd, 3rd, 4th, 5th, 6th, or 7th feature of an above-mentioned this invention method in composition adoption of a dial discriminating display method which is the display performed repeatedly.

[0024]On the other hand, the 1st feature of this invention device extracts a signal which transmits a communication line top, Identify the extracted signal concerned, and the signal concerned restricts to a dial signal, changes the signal concerned, and considers it as a dial, A circuit interface part which is a device which displays the dial concerned, dichotomizes, inputs a signal continuously extracted from said communication line in parallel with PB receiving circuit and DP receiving circuit, and performs receiving-circuit processing, When an output of said receiving-circuit processing from said PB receiving circuit and DP receiving circuit of the circuit interface part concerned exists, judge whether the output concerned is based on a dial signal, become final and conclusive a dial, and. It is in composition adoption of a dial discrimination expression device possessing a control section which performs interior-action control, a dial accumulating part in which said settled dial is stored up in the control section concerned, and a dial indicating part which receives and displays a dial from the dial accumulating part concerned.

[0025]Said PB receiving circuit in the 1st feature of the above-mentioned this invention device the 2nd feature of this invention device, Perform signal transformation of said inputted signal and it is judged whether it is based on a PB signal, Are a circuit which restricts when proved that it is a PB signal, changes the inputted signal concerned into dial information, and is outputted to said control section as a result of said receiving-circuit processing, and said control section, An output of said receiving-circuit processing in the case of an output from said PB receiving circuit, Without making said judgment, process the output concerned, and said dial is become final and conclusive, and it is in composition adoption of a dial discrimination expression device which has an interior-action control facility which stores up the dial concerned in said dial accumulating part.

[0026]Said PB receiving circuit in the 1st feature of the above-mentioned this invention device the 3rd feature of this invention device, Are a circuit which changes said inputted signal into signaling information, and is outputted as a result of said receiving-circuit processing so that it can be judged in said control section whether it is a PB signal, and said control section, An output of said receiving-circuit processing in the case of an output from said PB receiving circuit, When said judgment whether said extracted signal is a PB signal is made on the basis of character of a PB signal based on said signaling information and it is judged as a PB signal by the judgment concerned, Change the signaling information concerned into a dial, and said dial is become final and conclusive, and it is in composition adoption of a dial discrimination expression device which has an interior-action control facility which stores up the dial concerned in said dial accumulating part.

[0027]Said DP receiving circuit in the 1st, 2nd, or 3rd feature of the above-mentioned this invention device the 4th feature of this invention device, Perform signal transformation of said inputted signal and it is judged whether it is based on DP signal, Are a circuit which restricts when proved that it is DP signal, changes the inputted signal concerned into dial information, and is outputted to said control section as a result of said receiving-circuit processing, and said control section, An output of said receiving-circuit processing in the case of an output from said DP receiving circuit, Without making said judgment in said control section, process the output concerned, and said dial is become final and conclusive, and it is in composition adoption of a dial discrimination expression device which has an interior-action control facility which stores up the dial concerned in said dial accumulating part.

[0028]Said DP receiving circuit in the 1st, 2nd, or 3rd feature of the above-mentioned this invention device the 5th feature of this invention device, Are a circuit which changes said inputted signal into signaling information, and is outputted as a result of said receiving-circuit processing so that it can be judged in said control section whether it is DP signal, and said control section, An output of said receiving-circuit processing in the case of an output from said DP receiving circuit, When said judgment whether said extracted signal is a DP signal is made on the basis of character of DP signal based on said signaling information and it is judged as DP signal by the judgment concerned, Change the signaling information concerned into a dial, and said dial is become final and conclusive, and it is in composition adoption of a dial discrimination expression device which has an interior-action control facility which stores up the dial concerned in said dial accumulating part.

[0029]The 6th feature of this invention device has said dial indicating part in the 1st, 2nd, 3rd, 4th, or 5th feature of the above-mentioned this invention device in composition adoption of a dial

discrimination expression device which is LED of one column display.

[0030] Said control section in the 1st, 2nd, 3rd, 4th, 5th, or 6th feature of the above-mentioned this invention device the 7th feature of this invention device, It is in composition adoption of a dial discrimination expression device possessing a reset button which initializes the control section concerned, said dial accumulating part, said circuit interface part, and said dial indicating part.

[0031] The 8th feature of this invention device has said device in the 1st, 2nd, 3rd, 4th, 5th, 6th, or 7th feature of the above-mentioned this invention device in composition adoption of a dial discrimination expression device which is a palm-sized size.

[0032] Said control section in the 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, or 8th feature of the above-mentioned this invention device the 9th feature of this invention device, When decision of a dial new within predetermined time is not made, it is in composition adoption of a dial discrimination expression device which has an interior-action control section presumed to be a reception end of a dial signal.

[0033] In the 9th feature of the above-mentioned this invention device, the 10th feature of this invention device has said control section in composition adoption of a dial discrimination expression device which has an interior-action control facility which displays a dial on order accumulated in said dial indicating part at said dial accumulating part, when [said] presumed.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] A dial discriminating display method is shown.

[Drawing 2] The internal configuration of a dial discrimination expression device is shown, and the physical relationship of the terminal in the case of use and a switchboard is shown simultaneously.

[Drawing 3] An example of the outline view of a dial discrimination expression device is shown.

[Drawing 4] A part of motion control of CPU is shown.

[Drawing 5] A part of motion control of CPU following drawing 4 is shown.

[Drawing 6] A part of motion control of CPU following drawing 5 is shown.

[Description of Notations]

alpha — Dial discrimination expression device

beta -- Terminal

gamma -- Exchange station

C -- Connecting cord

L -- Communication line

RB -- Reset button

SW -- Electric power switch

1 -- Circuit interface part

10 -- Terminal area

11 -- PB receiving circuit

12 -- DP receiving circuit

2 -- Control section

21 -- CPU

3 -- Dial accumulating part

4 -- Dial indicating part

[Translation done.]

Partial Translation of Reference 3

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Column 11, Line 34 to Column 12, Line 23

[0042] When there is signal transmission on a communication line as a target for test evaluation, a transmitted signal is extracted (Step 1), and parallel processing is carried out for the extracted signal (Step 2). In the parallel processing, regardless of a type of the extracted signal, such as a dialing signal, PB receiving processing and DP receiving processing are carried out independently in a parallel manner.

[0043] Here, the PB receiving processing is processing for converting only a PB signal to original dialing of the PB signal, and outputting the dialing. Also, the DP receiving processing is processing for converting only a DP signal to original dialing of the DP signal, and outputting the dialing. There is no signal, for which results of both the PB receiving processing and the DP receiving processing exit, in view of nature of the PB signal and the DP signal, and communication arrangements between a terminal and an exchange.

[0044] When there exists no result of the receiving processing in Step 2, this means that the extracted signal is not a dialing signal. Also, when there exists a result of the PB receiving processing or the DP receiving processing, the result of the receiving processing, that is, the dialing, is accumulated in an accumulating means (Step 3).

[0045] Steps 1 to 3 are carried out continuously when there is extraction of a signal in Step 1.

[0046] In addition, when the extracted signal is determined to be a dialing signal, and a next dialing signal is not extracted after a predetermined period of time elapses, the accumulated dialing is displayed on the accumulating means. At this time, when there is extraction of a signal (Step 1), the processing of Step 2 is carried out. Then, when a dialing signal is determined to be extracted, display of the dialing that has been carried out separately is stopped, for example, in the middle of or at the end of the receiving processing in Step 2, or as the processing moves from Step 2 to Step 3.

[0047] The processing does not need to be stopped at all the time. The fact that there is extraction of a new dialing signal may be displayed to allow the user of a dialing identification display method to know the fact, and only the accumulated dialing in the accumulating means may be displayed until the user presses an appropriate button, and such display may be stopped when the appropriate button is finally pressed. In addition, start of displaying dialing on the dialing means is not limited to the above, and display may be started when a display start button that is different from the above

- button is pressed.